EBMesh : Embedded Boundary Mesh generation tool

EBMesh is an open source tool to generate Cartesian meshes for embedded boundary algorithms by using a ray-tracing technique.

By this tool, each mesh cell is distinguished as being inside, outside, or on the boundary of the input geometry, which is determined by firing rays parallel to x/y/z coordinates. The most expensive process of the embedded boundary mesh generation, an edge-geometry intersection test, is performed for the group of edges on a fired ray line together, which decreases the computational complexity of the whole method significantly. Produced boundary cells also have edge-cut fraction information and volume cut fraction information for each material.

EBMesh tool can directly import various CAD-based solid model formats and facet-based formats. Mesh results are used by exporting in a variety of file formats or by linking as library with query functions.

This tool achieves $O(N^2 \log N_t)$ compared by $O(N^3 \log N_t)$ from other methods (N : # of division of enclosing box sides, Nt : # of input surface facet triangles).

Building

Building MeshKit for EBMesh
: How to build MeshKit to use EBMesh.